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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/813,454	03/30/2004	Yasushi Saito	7217/71977	4691

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EXAMINER

NORTON, JENNIFER L

ART UNIT

PAPER NUMBER

2121

DATE MAILED: 01/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/813,454	<b>Applicant(s)</b> SAITO, YASUSHI	
	<b>Examiner</b> Jennifer L. Norton	<b>Art Unit</b> 2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

### DETAILED ACTION

1. Claims 1-6 are pending.

#### *Drawings*

2. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: Fig. 4, character reference SP4. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either

"Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No.: 6,204,988 (hereinafter Codilian).

3. As per claim 1, Codilian discloses an automatic gain adjustment device of a feedback control system that uses a phase difference between an output signal obtained from a controlled object and an input signal while controlling the object based on the input signal, the automatic gain adjustment device comprising

phase shifting means connected to an input stage of the feedback control system for shifting a phase of the input signal (col. 2, lines 18-55), wherein

a phase shift amount of the phase shifting means is set so that a frequency of the input signal to be supplied to a closed loop coincides with a crossover frequency at

which an open loop gain of the feedback control system becomes 0 db (col. 1, lines 54-67, col. 2, lines 1-17 and col. 7, lines 24-30).

4. As per claim 4, Codilian discloses an automatic gain adjustment method for a feedback control system that uses a phase difference between an output signal obtained from a controlled object and an input signal while controlling the object based on the input signal, the automatic gain adjustment method comprising the steps of:

setting a phase shift amount so that a frequency of the input signal to be supplied to a closed loop coincides with a crossover frequency at which an open loop gain of the feedback control system becomes 0 dB (col. 1, lines 54-67, col. 2, lines 1-17 and col. 7, lines 24-30); and

shifting a phase of the input signal based on the phase shift amount set in said step of setting (col. 2, lines 18-55).

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Codilian in view of U.S. Patent No.: 5,331,299 (hereinafter Smith).

7. As per claim 2, Codilian does not expressly teach the automatic gain adjustment device as set forth above comprising:

a multiplier for multiplying the input signal and the output signal obtained from the controlled object; and

an integrator for integrating product results of the multiplier, wherein the open loop gain is converged to 0 dB by adjusting a gain of the feedback control system based on a sign of an output value of the integrator.

Smith teaches a multiplier for multiplying the input signal and the output signal obtained from the controlled object (col. 4, lines 54-57 and Fig. 1, element 38); and

an integrator for integrating product results of the multiplier (col. 4, lines 64-67 and Fig. 1, element 40), wherein

the open loop gain is converged to 0 dB by adjusting a gain of the feedback control system based on a sign of an output value of the integrator (col. 2, lines 18-50, col. 4, lines 64-67 and Fig. 1, element 40).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the applicant's invention to modify the teaching of Codilian to include a multiplier for multiplying the input signal and the output signal obtained from the controlled object; and an integrator for integrating product results of the multiplier, wherein the open loop gain is converged to 0 dB by adjusting a gain of the feedback

control system based on a sign of an output value of the integrator for the advantage of reducing feedback of the DC component (col. 4, lines 67-69 and col. 5, lines 1-2).

8. As per claim 5, Codilian does not expressly teach the automatic gain adjustment method as set forth above comprising the steps of:

    multiplying the input signal and the output signal obtained from the controlled object;

    integrating results of the step of multiplying; and

    converging the open loop gain to 0 dB by adjusting a gain of the feedback control system based on a sign of an output value that has been integrated in the step of integrating.

    Smith teaches to multiplying the input signal and the output signal obtained from the controlled object (col.4, lines 54-57 and Fig. 1, element 38);

    integrating results of the step of multiplying (col. 4, lines 64-67 and Fig. 1, element 40); and

    converging the open loop gain to 0 dB by adjusting a gain of the feedback control system based on a sign of an output value that has been integrated in the step of integrating (col. 2, lines 18-50, col. 4, lines 64-67 and Fig. 1, element 40).

    Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the applicant's invention to modify the teaching of Codilian to include

multiplying the input signal and the output signal obtained from the controlled object; integrating results of the step of multiplying; and converging the open loop gain to 0 dB by adjusting a gain of the feedback control system based on a sign of an output value that has been integrated in the step of integrating for the advantage of reducing feedback of the DC component (col. 4, lines 67-69 and col. 5, lines 1-2).

9. Claims 3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Codilian in view of U.S. Patent No.: 5,602,896 (hereinafter Diepstraten).

10. As per claim 3, Codilian does not expressly teach the open loop gain is converged to 0 dB using a bisection method.

Diepstraten teaches to the open loop gain is converged to 0 dB using a bisection method (col. 4, lines 57-62).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the applicant's invention to modify the teaching of Diepstraten to include the open loop gain is converged to 0 dB using a bisection method for the advantage of using a small number of simple arithmetical operation to determine gain factors, which avoids the use of separate, complex control system for keeping the amplifies accurately adjusted to required absolute gain factors (col. 5, lines 18-23).



11. As per claim 6, Codilian does not expressly teach the open loop gain is converged to 0 dB using a bisection method.

Diepstraten teaches to the open loop gain is converged to 0 dB using a bisection method (col. 4, lines 57-62).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the applicant's invention to modify the teaching of Diepstraten to include the open loop gain is converged to 0 dB using a bisection method for the advantage of using a small number of simple arithmetical operation to determine gain factors, which avoids the use of separate, complex control system for keeping the amplifies accurately adjusted to required absolute gain factors (col. 5, lines 18-23).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following references are cited to further show the state of the art with respect to gain adjustment.

U.S. Patent No.: 5,072,192 discloses a phase loop demodulator comprising a primary phase loop and a secondary loop, wherein the demodulator includes a circuit for detecting primary loop locking.

U.S. Patent No.: 5,448,203 discloses a negative-feedback amplifier and to an apparatus and method for controlling a phase of a demodulated signal.

U.S. Patent No.: 6,144,261 discloses a Phase Locked Loop circuit (PPL) that includes a frequency difference memorizing portion.

U.S. Patent No.: 6,072,654 discloses a method for adjusting the frequency response of a servo loop.

Phase Shifter: A Nonlinear Circuit for Direct Measurement of Phase Margin in Feedback Control Systems discloses a phase shifter that accurately measures the phase margin of a linear system operating in a feedback control loop.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer L. Norton whose telephone number is 571-272-3694. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on 571-272-3687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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